

REMARKS

Claims 68 and 81 are amended. New claims 86-88 are added. Claim 83 is cancelled. Claims 65-82 and 84-88 are pending in the application.

Claims 68-70 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner states at page 2, paragraph 4 of the present action that claim 68 is indefinite because the word "as" renders the claim unclear. Without admission as to the propriety of the Examiner's rejection, independent claim 68 is amended to recite silver being uniformly distributed fine precipitates in an alloy microstructure. Accordingly, applicant respectfully requests withdrawal of the Examiner's § 112 rejection of independent claim 68 and of claims 69-70 which depend therefrom.

Claims 65-72 and 74-85 stand rejected under 35 U.S.C. § 102 as anticipated by either of Eguchi, Japan Patent No. 10287939 or Kardokus, U.S. Patent No. 6,113,761; or in the alternative under 35 U.S.C. § 103(a) as obvious over either of the two references. The Examiner is reminded by direction to MPEP § 2131 that anticipation requires each and every element of a claim to be taught by a single prior art reference. The Examiner is further reminded by direction to MPEP § 2143 that a proper obviousness rejection has the following three requirements: 1) there must be some suggestion or motivation to modify or combine reference teachings; 2) there must be a reasonable expectation of success; and 3) the combined references must teach or suggest all of the claim limitations. Claims 65-72, 74-82 and 84-85 are allowable over Eguchi and Kardokus for at least the reason that neither of the references disclose or suggest each and every limitation in any of those claims.

Independent claim 65 recites a physical vapor deposition target comprising an alloy of copper and from less than 1.0 at% to 0.001 at% silver, the alloy having a substantially uniform microstructure and fine grain size. Eguchi discloses a copper alloy that contains Cr, Pb and/or Bi, rare earth metal, and which may additionally comprise Zr. In addition to these elements the disclosed copper alloy can also contain Sn, Mg, Ni, Ag, Zn, Si and/or Mn (abstract, and translation at paragraph 5). Eguchi further discloses various processing to form a rolled sheet having a thickness of 0.2 mm with a crystal particle size up to 20 micron (paragraph 16, application example item 1). Eguchi does not disclose or suggest the claim 65 recited physical vapor deposition target comprising an alloy of copper and silver having a substantially uniform microstructure and fine grain size. Accordingly, independent claim 65 is not anticipated or rendered obvious by Eguchi and is allowable over this reference.

Kardokus discloses a high purity copper target of at least about 99.999 weight % purity and less than about 10 ppm of an alloying element which can be any of Ag, Sn, Te, In, Mg, B, Bi, Sb and P (col. 4, ll. 61 through col. 5, ll. 20). Kardokus further discloses that silver can be utilized in the range of from about 0.3 ppm to 10 ppm to allow the copper target to meet the minimum 99.999 weight % purity grade specification (col. 5, ll. 20-24). The Kardokus disclosure emphasizes the goal to maintain a purity of at least 99.999 weight % and preferably 99.9999 weight % purity of copper in the produced sputtering target (col. 1, ll. 16-24; col. 2, ll. 43-47; col. 3, ll. 11-14; col. 4, ll. 61-64; col. 5, ll. 20-24; tables 2 and 3 and the accompanying text). Kardokus teaches away from using higher levels of impurities or alloying elements and therefore does not disclose or suggest the claim 65 recited silver being present in the alloy from less than

1.0 at% to 0.001 at%. Accordingly, independent claim 65 is not anticipated or rendered obvious by Kardokus and is allowable over this reference.

Dependent claims 66-67 are allowable over each of Eguchi and Kardokus for at least the reason that they depend from allowable base claim 65.

Each of independent claims 68 and 71 recite a physical vapor deposition target comprising an alloy of copper and silver, the silver being present in the alloy at from less than 1.0 at% to 0.001 at%. Independent claims 68 and 71 are allowable over each of Eguchi and Kardokus for at least reasons similar to those discussed above with respect to independent claim 65. Dependent claims 69, 70 and 72 are allowable over each of Eguchi and Kardokus for at least the reason that they depend from corresponding allowable base claims 68 and 71.

Independent claim 74 recites a physical vapor deposition target comprising copper and having an average grain size of less than or equal to 30 microns. As discussed above, Eguchi does not teach or suggest the recited physical vapor deposition target comprising copper. Accordingly, independent claim 74 is not anticipated or rendered obvious by Eguchi and is allowable over this reference.

Kardokus discloses high purity copper targets having a grain size of not more than about 50 microns (col. 2, ll. 2-3 and col. 4, ll. 2-4). Kardokus does not teach or suggest the recited physical vapor deposition target comprising copper having an average grain size of less than or equal to about 30 micrometers.

Dependent claims 75-80 are allowable over each of Eguchi and Kardokus for at least the reason that they depend from allowable base claim 74.

As amended, independent claim 81 recites a physical vapor deposition target comprising a copper material having at least one of silver and tin and having an average

grain size of less than about 30 micrometers. The amendment to independent claim 81 incorporates the subject matter of dependent claim 83. Claim 83 has been appropriately cancelled. Independent claim 81 is allowable over each of Eguchi and Kardokus for at least reasons similar to those discussed above with respect to independent claim 74.

Dependent claims 82 and 84-85 are allowable over each of Eguchi and Kardokus for at least the reason that they depend from allowable base claim 81.

Independent claim 73 stands rejected under 35 U.S.C. § 102(b) as being anticipated by or obvious over Reda (Amorphous Copper-Silver Films with High Stability, (1983)). Independent claim 73 recites a physical vapor deposition target comprising an alloy of copper from 50 at% to 70 at% silver, the alloy having a substantially uniform microstructure and fine grain size. Reda discloses forming a copper-silver film by cooling a copper-silver vapor onto a substrate. Reda does not disclose or suggest the recited alloy having a substantially uniform microstructure and fine grain size or the recited physical vapor deposition target comprising such alloy. Accordingly, independent claim 73 is not anticipated or rendered obvious by Reda and is allowable over this reference.

New claims 86-88 do not add "new matter" to the application since each is fully supported by the specification as originally filed. Claim 86 is supported by the specification at, for example, the tables at page 10 and the corresponding text. Claim 87 is supported by the specification at, for example, page 5, lines 19-22 and page 6, lines 14-15. Claim 88 is supported by the specification at, for example, page 9, lines 8-11 and page 11, line 14 through page 13, line 2.

For the reasons discussed above claims 65-82 and 84-85 are allowable, and claims 86-88 are believed allowable. Accordingly, applicant respectfully requests formal allowance of pending claims 65-82 and 84-88 in the Examiner's next action.

The Examiner states at page 2 of the present action that a new oath or declaration is required due to the presence of a handwritten correction on the original declaration. As indicated by the Examiner during a telephone discussion in July 2002, the oath/declaration requirement can be fulfilled by a proper statement by the attorney who prepared and filed the declaration stating that the correction does not alter the affirmations of the oath or declaration, and that the correction was not made subsequent to the execution of the document. Applicant includes herewith the statement of Mark S. Matkin, Reg. No. 32,268, attesting to the fact that the subject correction was present on the original declaration upon receipt of the executed document from the inventor and was not entered subsequent thereto, and that such correction does not change the affirmations of the declaration. Accordingly, applicant believes that the declaration submitted on May 2, 2000 is valid in accordance with MPEP § 602.01 and that no substitute declaration is necessary.

Respectfully submitted,

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Group Art Unit..... 1742
Examiner S. Ip
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Title: Physical Vapor Deposition Targets

VERSION WITH MARKINGS TO SHOW CHANGES MADE ACCOMPANYING
RESPONSE TO JULY 3, 2002 OFFICE ACTION

In the Claims

The claims have been amended as follows. Underlines indicate insertions and
~~strikeouts~~ indicate deletions.

68. (Amended) A physical vapor deposition target comprising an alloy of
copper and silver, the silver being ~~present as~~ uniformly distributed fine precipitates in
the alloy microstructure and being present in the alloy at from less than 1.0 at% to 0.001
at%.

81. (Amended) A physical vapor deposition target comprising a copper
material having at least one element selected from the group consisting of silver and tin,
having an average grain size of less than about 30 micrometers, and having an
electrical resistivity of from about 1.7 microohms.cm to about 1.82 microohms.cm.

83. (Cancelled)

New claims 86-88 are added.

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